

AVIATION

The Oldest American Aeronautical Magazine

JULY 4, 1927

Issued Weekly

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Fokker Universal of the Pacific Air Transport flying past Mount Hood

SEE PAGE 251

VOLUME
XXIII

SPECIAL FEATURES

NUMBER
1

MEETING SERVICE NEEDS
RECONNOITERING OVER NICARAGUA
RADIO BEACON TO GUIDE HAWAIIAN FLIERS

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under Act of March 3, 1879



As shown in performance on its appearance

SORRY

*but we cannot enter the
tour as we had planned,
and properly take care
of our distributors -*



Big Standard Aviation Airplane



Big Standard Aviation Airplane

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tribunes of mail standing. Because
our business distinguished appearance
super performance and our price of \$244500
have made the American Eagle popular.

AMERICAN EAGLE AIRCRAFT COMPANY

2328 HARRISON STREET, KANSAS CITY, MISSOURI



THE Standard Oil Company (Indiana), well known to owners of the Middle West as the manufacturer of Stanolind Aviation Gasoline and Avia Oil, has now given a further impetus to commercial aviation by the purchase of a passenger airplane for the use of its directors and technical staff.

This plane, which was built by the Stout Metal Airplane Division of the Ford Motor Company, is the last word in passenger airplane construction, and is as safe as any automobile or railroad train. It is motored with three Wright model J-4-F radial type air-cooled engines, developing a total of 600 horsepower. It has a cruising speed of 100 miles per hour, and a cruising radius of 500 miles. It carries eight passengers in addition to the two pilots which constitute its crew.

The plane was purchased, not as a plaything or an advertisement, but for the purpose of increasing the efficiency of the organization and saving the time of the officials. The Company operates over a territory covering half a continent. It is frequently necessary for the directors and technical staff to make journeys to branch offices or refineries in the outlying parts of this territory. By traveling in this plane instead of by rail, they can save a full day's time on some of the longer trips.

It is expected that the Company's purchase of the plane will stimulate public interest in commercial aviation and increase confidence in the safety of air conveyances.

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at practically all leading fields in the Middle West*

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(INDIANA)

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CHICAGO, ILLINOIS



THE growth of the Boeing Airplane Company is one of those astounding developments with which America is startling the world. A factory personnel, chosen for achievement and ability factory buildings originally designed for future expansion, rather than for past needs competent aeronautical engineers creating new designs these, and many other factors have surely played their part in the earned reputation behind every Boeing plane.

Boeing Airplane Co.
Seattle, Washington

Mail by Air and Speed it There

A Correction

Through a regrettable error in the Boeing Airplane advertisement in the June 6th issue of this magazine, the following statement appeared:

"That this keen vision is appreciated is borne out by the fact that in the first four months of 1927 the Boeing Airplane Company has produced a thousand various type planes"

The Advertisement Should Have Read:

"That this keen vision is appreciated is borne out by the fact that since our business was established in 1916, we have produced a thousand various type planes"

Botsford-Constantine Co.

Advertising

Seattle

Portland

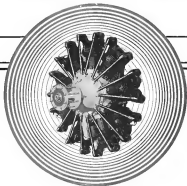
San Francisco

MAIL BY AIR AND SPEED IT THERE

Wasp & Hornet
LEADERSHIP

The Wasp
435 H.P.
at 1900 R.P.M.
Weight 650 lbs.

The Hornet
525 H.P.
at 1900 R.P.M.
Weight 710 lbs.



These unique features have been developed
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1. One piece Master Connecting Rod and Built-up Crankshaft
2. Devised and Forged Aluminum Main Crankcase
3. Grouping of all accessories at the rear of the engine
4. Complete enclosure of all working parts

The fundamental design improvements of the Wasp and the Hornet have considerably influenced all new air-cooled radial engines, and entirely new fields have been created for this type of aircraft power plant.

THE
PRATT & WHITNEY AIRCRAFT CO.
HARTFORD, CONNECTICUT

DEPENDABLE ENGINES



CLIMB

THE "CORSAIR" official climb in 10 minutes is phenomenal for two-place planes, equalling or exceeding that of Service Single-Seater Pursuit Types, altho such planes are much lighter and carry a much smaller useful load. At 18,000 feet the rate of climb of the "Corsair" is unapproached, and at such altitudes it will outmaneuver and outfly Service Single-Place Pursuit Planes.

CHANCE VUGHT CORPORATION
LONG ISLAND CITY, NEW YORK



**WORLD'S TRANS-ATLANTIC RECORD —
WORLD'S ENDURANCE RECORD**

both held by Wright-Bellanca plane
equipped with

BOHN RING TRUE BEARINGS



Once again the world is thrilled with a
surviving Trans-Atlantic flight — the
time by Clarence Chamberlin and Charles
A. Levine

And again Bohn Ring True Bearings have
played their part in achieving the final
splendid result

For the Spirit of St. Louis with which the
indestructible Lindbergh made his flight
was equipped with Bohn Ring True
Connecting Rod Bearings

And now the Wright-Bellanca plane, the
holder of the world's record of 51 hours
for sustained flight, and the one with
which Chamberlin and Levine made their
perilous crossing, to which a new world's
enduring long distance record was estab-
lished, is equipped with Bohn Ring True
Bearings

We are proud to feel that Bohn Ring True
Bearings should have had a part in these
so magnificent and thrilling achievements

BOHN ALUMINUM & BRASS CORPORATION
DETROIT, MICHIGAN

Also makers of Eccentric Chasers and Jolins
Automatic Planes

BOHNALITE



For Hangars and other Aircraft Buildings they are Coming to Austin

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merit and won ever growing recognition.

Austin Engineers can furnish valuable information on hangars, airports, shops,
manufacturing plants, etc., to any corporation or municipality interested.
Under the Austin Method of Undivided Responsibility, design, construction,
and equipment are all handled by this one organization under one contract
which guarantees total cost for the complete project in advance, completion
date with bonus and penalty clause, if preferred, and quality of materials
and workmanship.

In case this complete service is not required, Austin can furnish plans,
specifications, and materials.

Under other plans the speed and thoroughness of Austin's work is an
important factor to the owner.

Write, phone the nearest Austin Office, or mail the Memo below.

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New York, Cincinnati, Chicago, Detroit, Pittsburgh, St. Louis, Seattle, San Francisco
The Austin Company of Texas (Dallas) The Austin Company of California (Los Angeles and San Francisco)

AUSTIN
Complete Building Service

Memo to THE AUSTIN COMPANY, Cleveland. We are interested in

information regarding the design, construction, and equipment of a

hangar, shop, or other aircraft building. We are sending you a general copy of

"The Austin Way of Building" published by the Austin Company of

Texas. Please send me a copy of this publication. My name is

Mr. _____, of _____, City _____, State _____.



THESE five words express the platform and governing principle of the research program now under way in the shops, laboratories and draughting rooms of The Glenn L. Martin Co.

No element of design—no detail of construction—no item of material is being approved for further use with-

out re-study and scrutiny and an exhaustive search for something better, even though the margin of the particular improvement achieved may seem in itself insignificant.

Out of this research notable and far-reaching advances in the art of aeronautics are taking form.



THE GLENN L. MARTIN COMPANY

Builders of Quality Aircraft since 1909
CLEVELAND, OHIO

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With the Editor

As these few lines are being written two American airmen are awaiting the favorable opportunity to take their places off California ground in an attempt to pilot them to the Hawaiian Islands. If either, or both, of them reach their objective American men in American made airplanes will have "beamed the compass" with successful flights, north to the Pole, east to Europe, south to South America, and west to the Hawaiian Islands.

It seems a record of unexcelled achievement as when we all would be proud to see American men achieve what our policy board of tomorrow such as it is, is endeavoring to do. But who have staked their lives for the cause? Yet it is only of late that the man in the street has begun to realize the great importance and value of the airplane. For years airplanes have been making successful flights every day right here in our own country, but the man in the street has not noticed the activity of progress above his head. Strange as it may appear it was not until the airplane flew across his horizon that he began to sense the significance of this new means of travel.



Fairchild have created a new cabin monoplane. Quite the finest machine in its class. The pilot's seat has been placed into the cabin. Powered with the Wright 204 H. P. "Whirlwind" it is the most serviceable plane for the transport of passengers and express goods. Extreme stability and spontaneous response to the controls make the Fairchild Monoplane easy to handle and a pleasure to fly. The cabin provides seating accommodation for four passengers and the pilot. The total laden weight is 3325 lbs., of which 750 lbs. is available for passengers and freight. Maximum speed 134 miles per hour approximately. Wing span 46 ft., or 12 ft. when folded. Write us about your aerial problem. Fairchild facilities are at your disposal.

Fairchild Airplane Mfg. Corporation
Farmingdale, Long Island

DIVISION OF FAIRCHILD AERONAUTIC CORPORATION



Vol. XXIII

JULY 4, 1927

No. 1

Sightseeing vs. Time Saving

WHENEVER THE possibilities of passenger air transportation are discussed, the chief advantage that is mentioned is the saving of time. Important as this feature is, there is another situation for passengers that should not be overlooked. Sightseeing is one of the items generally employed to cover a more leisurely sort of travel, but apparently being neglected in the plan for inducing passengers to use aircraft. When compared to the time actually saved by travel by air, the sightseeing time should not be passed over as an unimportant factor.

In the European air lines practically all routes are laid out as the least wrong lines, the shortest distance between cities being selected as the most advantageous route. An often happens, the air tourist never views that he greatly wishes to see. Take for example, the air route from Cologne to Frankfurt. This follows the direct line and the air tourist never sees all the romantic and picturesque scenery of the Rhine. If a half hour's flying were added to the flight it would become famous as one of the great scenic air trips of the world. Another route that overlooks this point is the Paris-Boston flight. No attempt is made by night detours to give passengers a view of Rome, Chicago, Denver, St. Michel and other places of the greatest historical importance. It may be said that if a half hour is an hour were added to every air trip in Europe, and the sightseeing feature emphasized, aerial travelers would be willing to pay the extra cost and thousands would be attracted who now visit the off-the-beat places by motor bus.

With the United States does not afford so many objectives of historic or scenic interest, it is possible to see how the advantages of the detour should be given serious consideration. Take the New York to Chicago route as an instance. If our passengers who were not passed for time could be given an opportunity of flying up the beautiful Hudson as far as the Catskills and then over Niagara Falls, many might take the trip who otherwise would go by boat and train. From New York to Washington there are many spots associated with the Revolution that would give air lines a great opportunity to sell the scenic advantages of their service.

The saving of time, under present conditions, and as the element of night passenger travel, is one of these questionable advantages of air travel, if it is granted that time between cities is the morning and five in the afternoon is the only period worth saving. With the sightseeing development many air lines could be operated which could have elastic schedules, and even make round trips, with little thought of saving time. The sightseeing industry in the country is growing every year and aircraft should secure a part of the traffic along with the development of the more precise air transportation.

Landing Fields

A BRIEF study of the latest for aviation in the interest that the daily and occasional person is taking in the subject of landing fields. The editorial work of the Aeronautics Branch of the Department of Commerce and the opening of public interest in aviation that followed the recent trans-Atlantic flights with the American planes and American engines have recently advanced the directing of thought to this important matter.

Such being the case it would seem highly advisable for all those interested in the aeronautical welfare of the country to re-examine their efforts towards that end while public interest is at its peak. It might safely be said that the one great need of aviation within our limits is a greater number of landing fields throughout the country, and the nearer they are established the better it will be for commercial aviation. But at the same time the task must not be done haphazardly.

There can be no extensive development of commercial flying without proper ground facilities any more than there could be railway transportation without terminals, or water transportation without port facilities. Each of these forms of transport have their special requirements, and it happens that the outfit required for air terminals is small as compared with the rest of proper railroad or harbor facilities.

A heavy dose in the requirements of air terminals is airports. In smaller communities where large tracts of land, at reasonable cost, are obtainable close to the heart of the city, the problem is not a difficult one. It is the finding of suitable acreage close to the business center of most of our large cities, and at a cost not prohibitive, that creates a real problem. Fortunately, practically every large city has some water front, river or sea, and, fortunately, also, the development of the amphibious plane makes possible the utilization of these natural landing facilities.

Some experts who have given thought to the perplexing subject of potential close-in landing fields for large cities are inclined to the view that the methods have pointed a way to the solution of the problem, by the creation of great terminal stations short distances from cities, and then drawing motive power for the transfer of the passengers to the terminals in the center of the cities. With the use of amphibious operating as ferries between large air terminals located at desirable points some distance out, and water terminals in the midst of the population districts, passengers and freight could be moved in a very brief time, and the long lead times in and from distantly located aviation fields could be eliminated.

This is a plan to which students of air terminals are beginning to give thought, and it may prove the solution of the problem in each of our large cities as present specially difficult conditions.

Radio Beacons to Guide Hawaiian Fliers

Mailand and Hagenberger Hope to Cross Pacific by Means of Directional Radio Waves Flashed From Two Army Stations at San Francisco and Palo Alto

By ANDREW R. BOONE

NAVIGATION OF airplanes is expected to undergo a considerable revolution as the result of development of a radio beacon by which Lewis, Lester J. Mailand and Albert Hagenberger plan to pilot their army transoceanic (Wright Whirlwind) Fokker monoplane from San Francisco to one of the Hawaiian Islands.

Hagenberger made known the "radio navigation" plans at San Diego soon after his arrival at North Island to test the plane before proceeding on to San Francisco for the lay-off. The fact, which centers the world's attention on a new enterprise in trans-oceanic travel, navigation, sounds simple enough, yet for two years defied engineers of the United States air corps engineering division and the signal corps' laboratory at Dayton, Ohio, have devoted their time and skill to construction of the apparatus.

Search Start Flashing at the Take Off

Mailand and Hagenberger hope to reach Hawaii across 2018 miles of the Pacific by means of directional radio waves flashed from two army radio stations at San Francisco and Palo Alto on the mainland of Asia. The fliers will check their path of flight by astronomical observations, but from the War Department point of view the radio beacons, test become the undertaking of primary importance. This harness is believed ready for its first important practical test, success of which will mean as much to the future air navigator as did the old lightbeams in the sunset.

There are two 90-foot masts at San Francisco and Palo Alto. From these, two triangular loop aerials are suspended. Each loop extends out 330 ft. at the base of the mast and is capable, in reverse directional relation. One emits three loops early with the beam.

As soon as Mailand and Hagenberger take off from some field near San Francisco they will flash the San Francisco and Palo Alto beacons and Hagenberger will follow a course similar to a beam from a large searchlight. If the

plane veers to the left of the current line of flight the signals on this zone will die out or become unrecognizable. Should the monoplane swing northward from the course the signal will change from the center zone signal to a new signal which will warn Lester Hagenberger to correct his path at once. An automatic warning device at both stations will insure contact and accurate signals. "In a new instrument like this," said Lester Mailand recently, "many things may go wrong. I believe from past experience, however, that it will work. We will fly down our radio path to accuracy as possible."

Both Mailand and Hagenberger were selected by Army authorities to make the trans-Pacific flight because of their skill and familiarity with Hawaiian conditions. Each has sailed a total of five years in the islands and are familiar with the topography there. Because of conditions out far from the California shore which will demand expert flying ability, they also to take off at seven o'clock in the morning. Between 550 and 560 miles out at a cross-wind zone, where they will experience their greatest probable drift. By leaving early in the morning the fliers will reach a point at noon where the sun's shadow will be at right angles to the current flight course. Thus Lester Hagenberger can determine by measurements his position and course at that time.

Will Head Straight for Maui

The navigator will take astronomical observations every two hours and drift observations every half hour in the strong wind zone. When the plane reaches the eastern edge of the strap-wind zone it will be about noon. At that point Hagenberger can tell by a quick glance at his charts (pre-inspected by Wesley Jones, a captain engineer) how far north or south the plane is off-course should the radio have proved unsatisfactory. Jones compared the Fokker to San Diego to complete his work in Hawaii's charts.

In flying across the Pacific according to Hagenberger, the Fokker will head directly for Maui, the approximate center

of the group of islands, which are about 400 in extent. The islands cover an area of about 50 degrees, which permits a narrow navigational area of about 50° per cent. The fliers know conditions there will enough to expect to find visibility. Because of the spray of waves, damp air, and conditions at higher altitudes to them a thick haze, which virtually blankets the islands. The greatest navigational danger lies in the fact that there is an 80-mile diameter be-

area could not be affected under two to three weeks. It is hoped that the new distributing arrangement will make it so that any purchaser can get an engine when he wants or needs it.

The new model engine is a development from the original design experience gained during the last season. Changes have been made which greatly increase the life of the engine, and which make for smoother and more satisfactory performance for the average operator who has had no previous engine experience. Major among the changes was the installation of a Durak combustion, which eliminated the double level contact previously necessary. The original bent-head steel piston jacket running on two screw bearings (as the standard) those has been replaced by a thrust journal of aluminum which is properly forged and heat-treated and used for machining. This change reduced the weight of the engine by eleven pounds and assisted materially in the dissemination of internal heat, especially when employed in association with the new rich carburetor which valves that have been adapted for use instead of the original valves. Other changes of a minor nature, such as improved over the original model, complete the list.

Air-Kings for Better Flying Service Inc.

The Becker Flying Service, Inc., has just contracted for a number of new Air-Kings, Model 27, which will be used at its flying field at Buffalo. The company will act as Air-King dealer for the western portion of New York. Plans



Lester Hagenberger "checking the map" and Lester Mailand

between Kauai and Oahu, over which the fliers might pass without sighting land. Yet the presence of the radio sets seems to forbid the probability of this danger.

The fliers will utilize other instruments than the radio to be absolutely safe. Hagenberger plans to make five stops in so many minutes of the way, since and planets at various times. After passing through the cross-wind zone the Fokker probably will fly as well as a tail wind which will facilitate their completion. It is planned to take observations about every two hours, and drift observations in the cross-wind area every thirty minutes. Radio communication after these signals from the beacon will be used.



B. J. Becker (left) and G. C. Plummer (right) of the Becker Flying Service, Inc.

will be used for passenger, student and general commercial purposes. The Becker Flying Service expects to make passenger flights from Buffalo over Buffalo and Niagara Falls. The Becker expects to make up a certain shipment and have the other planes come to him via freight.

Packard Builds Largest Airplane Engine

The largest airplane engine ever built is now at the plant of the Korthman Products Co. of Garden City, L. I., N. Y. It has twenty-four cylinders developing 1200 hp. at 2700 rpm. and was built by the Packard Motor Co. of Detroit. It is stated that the engine was designed for the Navy by Col. J. G. Yarnall and Capt. J. M. Widdow. The engine is of the X-type, weighing 1600 lb. with a bore of 5 1/2 in. and a stroke of 5 in.

The engine is to be used in a racing plane now being built at the Korthman plant for Kent A. Williams. Very little information on the plane is available at this time, as both the plane and engine are experimental. The findings and views are of opinion, as are the aluminum, rubber, and plastic. Williams hopes to make transoceanic speed with the plane.



The three engine Wright Whirlwind Fokker monoplane in which Lester Hagenberger and Lester Mailand plan to fly from California to the Hawaiian Islands.

Cam Engine Passes Fifty Hour Test

Fairchild Camliner Engine Corp. Development Announced in an Approved Type by the Department of Commerce and is Placed in Production

THE CAM type aircraft engine, which has been developed by the Fairchild Camliner Engine Corp. during the past two years, is now being placed in production by its manufacturers. Experimental engines have been subjected to endurance tests with no unsatisfactory results. The first of the production type engines was recently subjected to a fifty-hour test, which it successfully completed in less than fifty-two hours of elapsed time. The test was conducted at the Pennsylvania factory in the engine laboratory of the Company on June 15 to 17. During this test the engine was operated at about the cruising speed, averaging more than 100 hp at 500 r.p.m. of the propeller. The Fairchild Camliner can design permits operation of the engine with the same piston speed as the conventional crank engine, while the propeller is rotating at one half of the usual speed. Hence, this speed of 500 r.p.m. is equivalent to 1000 r.p.m. for crank type of engine. The important factors which it is possible to use a large and slow speed propeller instead of the usual high speed type, although without the use of propeller reduction gears and, while still maintaining high power output for fuel and piston displacement. Such a feature because of considerable interest in aircraft designers, as it results in greater overall efficiency of the power plant. It is of particular advantage in providing high thrust just when this is most necessary, during take-off and climb.

No Adjustments Necessary

Throughout the entire fifty hours of operation the engine performed perfectly—no adjustments being necessary. The two least adjustments which control during the test were caused by trouble directly spent from the engine itself. One of the steps was necessitated by clapping of the gasoline streamers by excess of water which collected in the gasoline drums and found its way into the line.

Immediately following the test the engine was completely dismantled. All parts were carefully examined and found to be in perfect condition; full compressions were indicated in all cylinders and no valve showed any signs of leakage when tested with gauges. As all bearings in this engine are of



Flashlight photo of the Fairchild Camliner engine completing the fifty hour test.

the cylinders of the cast engine. By this means, an air leak of about 50 m.p.h. was maintained and, although considerable slight leakage, the displacement cylinder experienced in flight was entirely sufficient for cooling purposes. The engineers of the company consider their entire satisfaction with the manner in which the engine passed this test and production orders have been placed to the factory.

Designed to Army Requirements

The Model 447-B has been designed to meet the requirements of army training aircraft as well as those of the commercial and sea land service. With its 447 cu. in. of piston displacement this engine develops 145 hp at 1150 r.p.m. or about 315 hp. per cu. in. of piston displacement. It is claimed that this is the highest power output (per unit of displacement) obtained to date with a non-supercharged aircraft engine. The weight of the engine compares with the weight of a standard engine of 447 cu. in. displacement, with the exception of a lighter and propeller hub, is 300 lb. Its overall width and height is 37½ in. and its projected frontal area is only 3.8 sq. ft. The compactness, low weight, and small frontal resistance—combined with the high power output at low propeller rotation—result in low airplane performance.

Due to the use of only four cylinders, the entire diameter of valve-inlet ports, and the elimination of counterweights, this engine possesses fewer and simpler component parts than customary aircraft engines. The use of the drive main

mechanism results in high power output per unit of piston displacement and allows a compact arrangement of parts resulting in light weight per horsepower while employing sturdy detail construction.

The log sheets of the test have been submitted to the U. S. Department of Commerce and were approved in accordance with the requirements of that department, the engine being announced as an approved type. It is stated it is the first engine to be submitted and officially approved under the supervision of the Department of Commerce aircraft regulations.

The Fairchild Camliner Engine Corp. claims that the inherent features of the engine such as light weight, efficient power output, operating speeds, low cost, simplicity of maintenance, and adequate durability, making it a most economical and reliable power plant.

European Air Routes Expand

About 35,000 miles of commercial air routes will be operated by European companies in 1937.

Additional air lines are reported in France, Sweden, Finland, Italy, Germany, Spain and Switzerland. The French have extended two lines across the Mediterranean to the north coast of Africa, and a Spanish line between Madrid and Sevilla via Lisbon has just been reported.

Most of the additional services in Germany are local, but plans are underway for additional international lines. A notable additional line connecting five countries is that between Vienna and Milan via Prague, Dresden, Berlin, Lohde and Copenhagen.

Airline transportation companies in Europe are said to be proceeding better lighting and communication services and improved facilities at airports for the protection and comfort of passengers.

New aircraft have been added in many instances and these have additional devices for increasing the safety and reliability of the machines.

European governments subsidize their air services from one half to one-fourth or more of the operating costs. They also provide terminal facilities, lighting, weather reports, loans for the purchase of new equipment, freedom from taxes and many other important aids.

The operating companies are reported to be reducing operating costs, increasing efficiency and, generally, improving their financial condition.

The Royal Air Service Company (RAFSC) has an excellent record of safety and reliability with its three-engine craft and has reduced its deficits. Its operating cost per ton mile was reduced from 41 ct in 1929 to 54 ct in 1935 and its passengers per ton mile increased from 1.5 to 2.5. The company is reported to be off supporting runs after expected further reductions to 24 cents per ton mile.

The new aircraft involved considerable effort between companies of different nationalities in promoting stability.

Example of Cooperation

A notable example of cooperation is the new line Swiss companies which arranged with the German Luftlinie Co. to exchange passengers between their several lines, the Swiss the operating line Swiss territory and from Basel to Frankfurt, the German company operating between other centers and Swiss cities near the northwestern quarter.

The Swiss companies exchange passengers with the Imperial Airways, Ltd., which routes between London, Paris, Basel, and Zurich with the French Air Lines which connects Geneva with Paris and Marseille via Lyons.

The Royal Air Service Company, in connection with the Royal Air Service Company of Britain, has started a coast service between Basel and Amsterdam via Brussels and Rotterdam.

Plans are underway for a Swiss company to form a link in the system to be provided by several companies between

Geneva and Spanish ports, and ultimately to be extended to Madrid and Atlantic seaports.

The Venice-Venice service is provided by the Austrian Air Service Company and the Transalpine Company (Italien), whose planes alternate. The Vienna-Paris-Berlin-Moscow service mentioned above is provided by the airlines of British, German, Czechoslovak and Austrian air forces. The Paris-Berlin service via Cologne and Rome is operated jointly by the German Air Transport Company (Deutsche) and the Luftverkehrsgesellschaft (Hessisch).

The Imperial Airways, Ltd., offers an excellent express and freight service, collecting and delivering packages in London and Paris and accepting the delivery at its airport terminals in several other cities. It operates continuous and frequent routes to many cities, several of which are not served by air but which receive shipments via railroad or steamship lines.

Postal authorities in several countries for providing additional arrangements for the exchange of mail and parcel post over the several air lines. Rates are quoted for parcel post packages from Marseilles, for instance, to several important centers in northern Europe.

Passenger rates are given in low as possible and it may be estimated—no longer than those offered to other means of transportation. The favorable rates quoted on shipments by air in cooperation with those by railroad and steamship are said to be made possible by the greater security of air shipment.

One large company makes a practice of carrying its passengers without additional cost.

Company Owned Plane for Contact Work

Regular use of company-owned airplanes for direct contact between the Detroit and Cleveland plants and with customers in many cities was inaugurated recently by Thompson Products, Inc., automobile and airplane parts manufacturer, according to E. G. Thompson, vice-president. Mr. Thompson, sponsor of the plan, purchased the first company machine, a three-passenger Laird biplane, in Chicago and



E. G. Thompson, vice-president of the Thompson Products, Inc. and the Laird plant that he flies.

After it took to the Cleveland plant in two hours and thirty-five minutes. Other machines will be added as required and longer space has been arranged for the planes at the Cleveland municipal air field.

A manager of the company's air time in addition, working under Mr. Thompson's supervision, will be paid directly from among several pilots with successful air record and company aircraft flight records. Mr. Thompson, whose company is among the first to regularly maintain airplanes for scheduled runs, predicts that during the next few years automotive manufacturing industry will find others in adopting airplanes as a more efficient means of transportation, both for emergency shipments of parts and for saving time on the travel time of executives and sales representatives.



The cam used in the fifty hour test.

the half or other type, nothing certain is obtained on all bearing surfaces and no sign of bearing wear could be detected after the test. The piston rollers and the ones (which in this engine takes the place of a crankshaft) were all carefully checked and no evidence of wear could be found by measurement.

In the test setup (in order to simulate the condition of flight), an O.K.-3 engine was used to create an air blast on

The New Consolidated Courier

Powered with a Wright Whirlwind and Designed to Meet Air Corps Specifications for Advanced Training Plane

IN THE latter part of 1926 the Air Corps issued specifications for a new advanced training plane that would be adaptable to the following classes of service: Flight training with dual controls, fixed gunnery training with gun or a Swift mount in the rear cockpit, for photographic training, and for general reconnaissance flying. The Consolidated Am-

erican Minor training planes are avoided by careful padding on the cockpit. The fuselage framing around the cockpit is strong enough to resist the majority of accidents. The outer section of the upper wing is strong that it would hold the fuselage off the ground if the plane turned over.

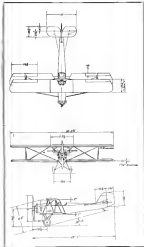
The Consolidated Courier embodies the same safety features which have enabled its predecessors, the Thrush and the Hawk, to hold up such extended safety records in their more than two years' use by the Army Air Corps and in the Naval Air Service in their primary training operations. Most of the parts are exactly the same as those in the Thrush and Hawk, thus simplifying replacements.

One of the main points in this design is the provision of excellent vision from both cockpits, the large wingtips and the controls in the upper and lower wings, aiding in landing this aircraft. The point which occupies the forward cockpit are easily seen by the landing gear.

Good for Cross-Country Work

The performance of the Courier makes it extremely valuable for cross-country work because of remarkable ability to get in and out of small emergency landing fields. Its normal gas capacity is 40 gal., but additional fuel is provided in extra tanks to give at least a 600 mi. cruising radius. The specifications called for a landing speed of less than 55 m.p.h. and a high speed full out at sea level of 120 m.p.h. The following performance was determined by the Material Division, Wright Field, Dayton, O.:

High speed	120 m.p.h.
Landing speed	45 m.p.h. (approx.)
Rate of climb, ground	950 ft. per min.
Service ceiling	33,000 ft.
Absolute ceiling	33,000 ft.
The ground specifications are:	
Span	34 ft. 5 1/2 in.
Chord	36 in.
Wing area	560 sq. ft.
Wing loading	54 lb. per sq. ft.
Wing center	27 ft. 7 in.
Length	27 ft. 7 in.
Wing area, including ailerons	590 sq. ft.
Wing area (14)	40 sq. ft.
Wingtip area	198 sq. ft.
Disposable load	
Pilot	240 lb.
Oil	20 lb.
Gas	120 lb.
Parachutes and load equipment	40 lb.
Total	420 lb.
Extra gasoline (20 gal.) and tank, for cross-country flying	230 lb.
Total	650 lb.



Three new drawings of the Consolidated Courier

erican Corp. of Buffalo, N. Y., have produced a new biplane with a Wright Whirlwind engine to meet the specifications and have called it the "Courier."

The Consolidated Courier is a convertible high plane or single seat airplane. The controls and installations in both cockpits are arranged so that either cockpit may be made quite clear for any desired purpose. The seats and controls have been arranged so that they may be readily adjusted to suit different pilots. The cockpits are roomy and all comfortable and it is also equipped with a large baggage compart-

ment. Minor training planes are avoided by careful padding on the cockpit. The fuselage framing around the cockpit is strong enough to resist the majority of accidents. The outer section of the upper wing is strong that it would hold the fuselage off the ground if the plane turned over.

At 4 p.m. of the same day the party landed at Budapest. From this point they will proceed to Constantinople, Aleppo, Baghdad, Samsat, Adana, Kermak, Delhi, Allahabad, Singapore, Bangkok, Saigon, Skopelos and finally to Hanoi.

American in Flight To Batavia

On June 15 Van Leer Block, of Rehoboth, Md., left Amsterdam, Holland, at 8:30 a.m. in a Fokker monoplane, for Batavia, Dutch India. He was accompanied by a nurse and two Dutch pilots.

At 4 p.m. of the same day the party landed at Budapest. From this point they will proceed to Constantinople, Aleppo, Baghdad, Samsat, Adana, Kermak, Delhi, Allahabad, Singapore, Bangkok, Saigon, Skopelos and finally to Hanoi.

Hints on Lubrication of Anzani Engines

Following a series of experiments at the Anzani factory, the manufacturers of the Anzani engine offer to owners of older Anzani the following hints whereby they can bring the oiling system of their engines up to the efficiency of the new engines, and to purchasers of new Anzani the instructions necessary for the installation of their engines.

The lubrication system of a radial six-cylinder aircraft engine has two major functions to perform, viz., to lubricate the motor and to carry off excess internal heat.

The usual means of performing these functions is to pump oil into the crankshaft under pressure, from whence it seeps off of the crank pin and bathes the inside of the engine. Part of the oil collects in the bottom of the crankcase and is pumped back to the tank and part is vaporous and seizes into a spray and exhausted from the breather pipe.

Many Systems Abandoned

In order to give a maximum of cooling effect with minimum of loss, many systems have been tried to allow the passage of a maximum of oil through the crankshaft with a minimum amount to the interior of the motor. As the best bearing wear upon all of these schemes and results in excessive oiling and breather loss, Anzani engineers abandoned them after experiment.

The original lubrication scheme consisted of a gravity feed of tank leading into a chamber by gravity, from the chamber a cone driven plunger pump forced metered quantities of oil to the main bearings and through drilled crankshaft passages to the crank pin, from whence the oil was thrown off and lubricated the interior of the engine. After performing its lubricating function, it seeped and blew out of the breather, thus filling its cooling function. This system was very satisfactory, though wasteful of oil, which caused some operators to evolve various schemes for saving the oil supply. This reduced the supply of oil for internal cooling and resulted in overheated pistons and bearings.

After much experiment, the following system was evolved. Remove the breather pipes from the top of the crankcase and plug the holes, remove the drain plugs from the bottom of the crankcase and put a collector tank below this level,

connecting it with these drain openings. Fit the breather pipes to the top of this tank on extraneous pipes, carrying them high up.

The excess oil will now drain into this tank and as no breathing is done through it, all oil suddenly lost as vapor and spray will condense and collect in this tank, from whence it may be pumped to the gravity metered tank by a hand pump or by a windmill or power driven return pump up to an overflow level in the common tank.

The engine, up to and including 1927 Models, are fitted with the old known plunger pump, while the 1928 Models will be fitted with the new return pump with a controlled bypass.

With the system described, always operate the oil pump at full feed, viz., full stroke on plunger pump (no spacer gasket under body flange) and with the by-pass handle of the new pump pointing towards the letter "O" stamped on the cover.

When the plunger pump is pointed for any other position, be sure to inspect the little check valve at the base and see that the oil seeps into holes in the base of the pump seal. It is also a good plan to stretch the spring to ensure the plunger following the operating stroke.

With the ordinary oil pressure gauge placed in the line between the pump and the oil feed into the bearings should give a reading of five to six pounds, which will drop somewhat with low speeds.

Treated With Castor Oil

At the Anzani factory the engines are treated with the highest obtainable grade of genuine cold pressed Castor oil, this lubricant is in general use in France for aircraft work and for many motor cars.

For those who desire a mixed blend motor oil, the company advise the use of "Walsford's Castrol, Grade K." This oil can be obtained from the C. G. Walsford Oil Company in New York or other agents.

Anzani engines cover a range from 30-50 hp. to 600 hp. The American distributor, the Brunswick Motor Laboratories, is located at Narragansett, R.I.



Wright "Courier" at Wright Field, Dayton, Ohio, N. Y. The plane at left is used by the American Inventory of the King, Gen. H. H. Wright, as a trainer for the official instructors. The small biplane on the right is a Fokker monoplane, being used by the American Inventory of the King, Gen. H. H. Wright, as a trainer for the official instructors. The small biplane on the right is a Fokker monoplane, being used by the American Inventory of the King, Gen. H. H. Wright, as a trainer for the official instructors.

Reconnoitering Over Nicaragua

(Continued from page 15)

later end of a pole, and it seemed such a hopeless thing for a man to expect to hit an explosion in flight with a rifle. Two days later when I went back to pilot, I studied the map plan to see if we could be lost on. This time I changed my mind about my being a joke. One bullet went through my upper wing, almost as far as about 5 inches and the gas tank by the way. Well it seemed that more or less luck must have entered into it, but I was convinced my good and all on the following Monday. Admiral Latham and General Fawcett arrived there at four places on a reconnaissance flight on the coast of Lake. It was on this flight that I learned General Phares's Army and they landed me, to the extent of fifteen miles on the plane, shooting away part of my rubber bag, nearly severing one of the control wires and causing me to lose my direction from the vicinity. After getting out of range, knocking my eye a few times, seeing that my observer was OK, I came back and gave the pilot the surprise of these times. A machine gun was an airplane can run to them. It should very much if they did at another machine airplane for some time to come.

Circular On Torsion of Wing Framework

The *Air Corps* has recently published an Air Corps Information Circular on the progress in the study of torsion of wing framework. The object of the investigation was to develop methods for analyzing the actual torsional rigidity, and to determine the type of wing structure which, for a given weight, has the greatest torsional rigidity.

The most important results thus far obtained, toward accomplishing the principal objects of the study are as follows:

1. It has been found that the torsional rigidity of a cantilever wing structure depends mainly on three characteristics:

- (a) The stiffness of the spars.
- (b) The location of the spars along the chord.
- (c) The type and design of the wing structure.

Of these three, the last characteristic has proved to be the most critical and the most difficult to handle. However, it was dependent for these determinations upon the material used, the moment of inertia of the spars, the degree of torsional stiffness required, and the necessary weight to be provided.

2. A method has been discovered for comparing approximately the stresses in a basic type wing frame subjected to simple torsional loads, and which has no end restraint moment, by the use of static equations. The stresses are, therefore, for members of the wing structure and can be used for comparing different types of wing structures in regard to their contribution to the torsional stiffness of the fuselage. This method of comparison is much more rapid than any previous methods available.

3. A criterion for determining which members of a given cantilever type wing frame are most important in regard to the stiffness of the whole frame, under any loading, has been worked out. For torsional loads, certain members of the wing structure are generally the most important.

4. Tests made with different sets of ribs for the same loading proved the importance of using the proper design of wing structure in order to obtain torsional stiffness. An increase in the use of ribs, which increased the total weight of the frame tested by only 13.3 per cent, decreased the torsional deflection by 54 per cent.

5. It was found that, in general, the torsional deflection was inversely in direct proportion to the torsional couple, and to the torsional moment of all the loads about the elastic axis.

6. Deflections obtained by superposition compared closely

with those measured in the experiments and were found to be on the conservative side.

7. Also tests indicate that there must be an elastic ribs, parallel to the spars at a constant wing station, about which the outer members rotate in circular arcs when the system is subjected to torsional moments. The ribs do not give directly, the location of this axis. However, a method was worked out to use a simplified method for using the test data to check the theoretical location. A very close check was obtained by the use of this method and data from tests made on the theoretical location determined by analytical computations.

8. The theoretical location of the elastic axis can be located quite accurately by means of the method at hand. Work for comparing stresses and deflections. However, this process is too long and tedious for practical design work; therefore a more rapid method was sought. A method was found which gives the approximate torsional stiffness very rapidly.

9. The effect of combined loading and torsional loadings upon the torsional deflections was determined by the tests and the analytical study. A formula was derived which may be used for predicting the torsional deflections, under any given or combined loadings, from experimental data for simple torsion loadings.

10. By means of the Least Work computations, a definite relation was found for the distribution of stress in a cantilever wing frame acted upon by simple torsional loads. These computations showed particularly that the stresses in members of the wing structure are the greatest at all lower wing ribs and decrease toward the supports. The stresses in the spars are the smallest at the outer end and increase toward the supports.

A complete (detailed) description of the various tests made, with actual results and conclusions reached, is given in *Air Corps Information Circular No. 254* which has been prepared by S. B. Peck, Naval Division, Air Corps.

Royal Canadian Air Force 1927 Program

Each year aviation is playing a greater part in the development and conservation of the natural resources of this Dominion. Actual participation in solving the most important problems of the forestry, navigation, migration, and exploration in their work in the same remote and unpopulated parts of the country, as well as in the varied districts and new applications of aerial methods to other lines of research are constantly enlarging the field of activities of the aviators.

Civil aviation in Canada is only now being born, but already it has a part in the regular activities of many of the departments of the Government and in of private enterprise in forestry and mapping and their allied activities.

The 1927 program of the Royal Canadian Air Force in civil operations, for permanent departments includes the following work:

From September to November, Alberta the Royal Canadian Air Force from the International Boundary to the Saskatchewan River is provided by aircraft the following service: To establish and maintain the airplane survey line in the northern and southern of the border area in the east and west of Lake Winnipeg and survey across northern Manitoba in the Arctic Islands.

Representative flights—United aerial photography in connection with mapping the British Columbia area and in the Maritime Provinces and the Air Corps of Canada in Quebec. United geographical reconnaissance from the Atlantic coast to the Pacific coast, and the Air Corps of Canada in the Maritime Provinces, and the Air Corps of Canada in the Maritime Provinces of Canada. United aerial photography for mapping the Quebec, Lake of the St. Lawrence and Lake St. Lawrence in Quebec. In the Maritime Provinces, the Air Corps of Canada and other aircraft will be sent to the Pacific coast and to the Atlantic coast. In the Maritime Provinces, the Air Corps of Canada and other aircraft will be sent to the Pacific coast and to the Atlantic coast. In the Maritime Provinces, the Air Corps of Canada and other aircraft will be sent to the Pacific coast and to the Atlantic coast.

Reconnaissance flights—The following service in the Western Provinces and the Royal Canadian Air Force. The service of reconnaissance flights will be provided by aircraft in connection with the development of power projects.

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PUBLISHER'S NEWS LETTER

The decision to promote Brig. Gen. Fuchet to be position of Chief of the Air Corps with the aim to create several orders out of the uncertainty regarding the future policy of the Corps was the first step since the separation of the active services of the Army from the Signal Corps, as several have been selected to command, who have previously been associated with the service. However, it has been possible for the General Staff to use this very attractive post to take care of some officers in another branch who desired promotion. With the enactment of new laws by Congress relating to the advancement and promotion of the Air Corps, this practice was prohibited and only officers who have had experience in the branch are eligible. Much credit should go to General Patrick for opposing the change. Before the law was passed, it was generally known that the General Staff was granting a brilliant officer for the post but his autonomy before the various General Staff committees disclosed a point of view that was so satisfactory that he was automatically eliminated from further consideration.

All hopes as to the effect to be selected centered on the advancement of one of the three Assistants to the Chief of the Air Corps. Brig. Gen. Fuchet had the advantage of seniority in his present rank although his end rank was that of fixed in the rank of Lieutenant Colonel. His experience in the Army as well as in the Air Corps had earned him the field. His command of Kelly Field gave him an intimate knowledge of the problems facing the Air Corps. As head of the Training and Operations Branch, while on duty in Washington, he further added to his experience and his selection for advancement was interpreted as well informed quarters. Brig. Gen. Gifford was also considered to have an excellent chance owing to the growing experience of the tactical problems. As head of the Supply Division and more recently as commander of the Experimental Station at McCook Field, he had acquired a wealth of experience that he could have and to great advantage as Chief of the Air Corps. Brig. Gen. Linton's claims rested on an evenly balanced basis. He is not only one of the members in aviation holding Military Aviator's License No. 3, but has won fame as a balloonist, having captured the Gordon Bennett Cup in 1934. For these reasons he had served commendably in the A. E. F. where service has shown played an important part in selection for important posts in the War Department since the Armistice.

Immediately after the announcement was made of the promotion of Brig. Gen. Fuchet, he made a statement that will go far toward making the future prospects brighter for other officers in the Air Corps who hope that some day they may reach the top. He said that after his last year's term had expired he would not accept reappointment. As General Fuchet will reach his 50th birthday in August of this year, he could have, if he were successful and ambitious, looked forward to two appointments before he reached the age of retirement. By voluntarily appearing to relinquish the position of Chief at the age of 49, he demonstrated and gave other officers an opportunity to secure promotion, he has rendered a service that is typical of his broad point of view and consideration for his fellow officers in the Corps. This new branch of the Army is essentially a young man's service and should be directed by men in the prime of life. They should fly and be able to command from the air if necessary. By making this decision Brig. Gen. Fuchet has cleared the way for the future and assured himself of a loyal and wholehearted support from every officer in the command.

Before the office of Assistant Secretary for War Air Administration was created, the Chief of the Air Service had to operate through the General Staff. All requests and suggestions had to be passed on by this all powerful group before it was presented to the Secretary of War for final approval. It is Lieutenant Colonel of the aviation branch of the Army, having been promoted to the rank of Major General, and drawing his \$10 per cent flying pay, had to deal through the General Staff, exclusively, the situation would be very difficult. Increased rank and pay for military aviation has always been a sore spot in the Army. With F. T. Tinker, Division as Assistant Secretary of War this disadvantage is avoided, for the Chief of the Air Corps now has an advocate that does not have to consult with the General Staff but is in direct contact with the Secretary of War. In fact, the relationship that will exist between the new Chief of the Air Corps and Assistant Secretary Division may approximate that of the Chief of Staff of the Army and the Secretary of War. The aircraft industry is fortunate in having as capable an influential man in the War Department as Mr. Doolittle. With Gen. Fuchet as Chief there should come a decided improvement in the morale and efficiency of the Army Air Corps.

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